8. Summary

Serological investigations about the exposure to foot-and-mouth disease virus (FMDV) in free-ranging roe deer (*Capreolus capreolus*) from selected areas of Germany - investigations concerning the FMD-outbreak in Europe in 2001

Foot-and-mouth disease (FMD) is an acute febrile infectious disease characterized by the formation of vesicles and erosions on mucous membranes (squamous epithelium) of the alimentary tract and on hairless skin. In addition to the order *Artiodactyla* families of the order *Insectivora*, *Rodentia*, *Proboscidea*, *Perissodactyla* and *Carnivora* are susceptible to a foot-and-mouth disease virus (FMDV) infection.

Most descriptions of FMD in naturally infected roe deer (*Capreolus capreolus*) in Europe are dated from 1930 to 1940. In these cases the diagnosis was based on clinical signs. Antibodies against FMDV were detected in experimentally infected roe deer in 1974/75 by virus neutralization test (VNT). It was shown that transmission of virus among deer was possible as well as mutual transmission between deer and livestock (cattle and sheep).

During the FMD outbreak in the Netherlands in 2001 (March and April) in a region close to Germany, FMDV-infection might have been transmitted to free-ranging roe deer in German regions near to the border of the Netherlands in the federal states of North-Rhine Westphalia and Lower Saxony. Therefore, our objective was to determine whether seropositive reactors against FMDV occurred in free-ranging roe deer in the investigation areas. In addition, the possible role of these animals during an FMD-epidemic has been discussed.

Liquid-phase-blocking ELISA (LPBE) and VNT are the prescribed tests for the detection of FMDV-specific antibodies in livestock. Procedures similar to these have to be applied for the detection of antibodies in wildlife.

In this study, LPBE and VNT were used for the detection of antibodies against FMDV serotype O_{MANISA}. In addition, a solid-phase-competition ELISA was performed.

Between October 2001 and October 2002 blood samples of hunted roe deer were collected in selected hunting grounds near to the border of the Netherlands in North-Rhine Westphalia (n=108) and Lower Saxony (n=43). This region was selected because of its location close to the area of the FMD-outbreak in the Netherlands in 2001. Control samples were taken from Schleswig-Holstein (n=72).

In LPBE, 12 (5.4%) of 223 sera were tested positive against FMDV O_{MANISA}. These samples originated from North-Rhine Westphalia (n=6), Lower Saxony (n=2) and Schleswig-Holstein (control areas; n=4). In SPCE, 22 (11.7%) of 223 sera were tested positive (North-Rhine Westphalia, n=7; Lower Saxony, n=7; Schleswig-Holstein n=12). These results were

considered false-positive because they could not be confirmed by LPBE and VNT, respectively.

Significant differences were recorded comparing (1) LPBE and SPCE, (2) LPBE and VNT and (3) SPCE and VNT. It became evident that SPCE in its current form does not seem to be an appropriate method for detecting antibodies against FMDV in hunted roe deer. Moreover, these results indicate that test procedures similar to those described for livestock can not generally be applied for wildlife.

In our study, seropositive reactors in roe deer were not detected. These results support serological investigations from the United Kingdom (UK) and the Netherlands in 2001 and suggest that FMDV may not have been transmitted to free-ranging roe deer in the investigation areas during the outbreak in 2001 in the Netherlands.

Investigations concerning FMD among cervids in Europe within the last century revealed that these animals do not seem to play an important role for the transmission of FMDV during an epidemic in livestock. The negative results of this study regarding the detection of antibodies against FMDV, as well as the serological investigations in the UK and the Netherlands lead to the conclusion that roe deer did not seem to play a role for the distribution of FMDV during the outbreak in 2001 in Europe.